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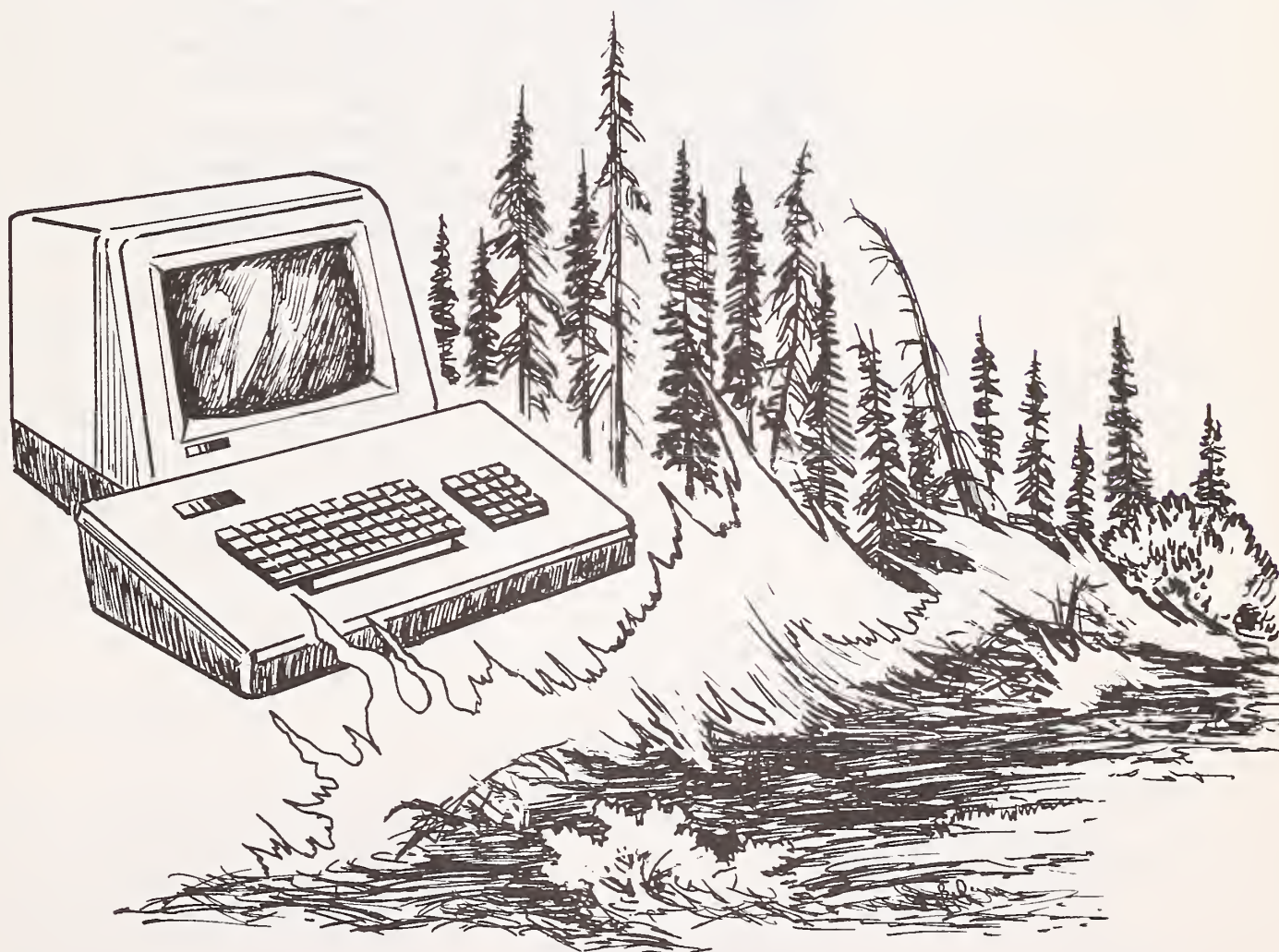
A Computer System for Testing Fire Management Prescriptions:

Part 2—Computer Terminal Operator's Manual

Collin D. Bevins
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THE AUTHORS

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RESEARCH SUMMARY

This report outlines the structure of a user-oriented computer system that allows fire managers to examine computerized historical fire-occurrence and weather records and identify ignitions that would have qualified as prescribed fires according to the conditions of a test prescription. Qualifying fires are "allowed to burn" under prevailing weather conditions until extinguished by precipitation or until they burn out of prescription. Test prescription parameters may include up to 60 fire-occurrence, fire-weather, fire-danger, and fire-manning-level variables.

Instructions for data entry and program execution are provided. Sample output demonstrates successful program execution. A companion report, Part 1—User's Guide (Bevins and Fischer 1983), is available as a separate general technical report.

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INTRODUCTION

The purpose of this report is to facilitate use of programs RXBUILD and RXFIRES. These programs provide information that can be used to evaluate alternative prescriptions for unscheduled prescribed fires within specific fire management planning areas. The programs examine historical fire-occurrence and weather records and identify ignitions that would have qualified as prescribed fires according to the conditions of a test prescription. Qualifying fires are "allowed to burn" under prevailing weather conditions until extinguished by precipitation or until they exceed prescribed conditions.

Program RXBUILD collates the necessary fire-occurrence and fire- weather data from computer archives and creates a data set specific to a fire management area. The data set may be printed at the user's request.

Program RXFIRES reads the user's test prescription and checks each historical fire for compliance. A table of unscheduled prescribed fires and wildfires by year and size class is printed. The user may also request a case history of each unscheduled prescribed fire and a fire load summary table. RXFIRES may be used repeatedly to test alternative prescriptions for a single fire management area data set created by program RXBUILD.

Programs RXBUILD and RXFIRES are written in ASCII 3.9X–77 FORTRAN and are available on the Region 1 shared library CSSG*R1LIB, USDA Forest Service, Fort Collins Computer Center, Fort Collins, Colo.

SYSTEM STRUCTURE AND OPERATION

The steps necessary to successfully operate RXFIRES are shown in table 1. The left-hand column identifies the steps usually performed by the fire management officer, fire planner, or other user of program output. This person is primarily concerned with selecting appropriate program inputs and interpreting program outputs. A companion report, Part 1—User's Manual (Bevins and Fischer 1983), provides instructions to these users.

The right-hand column of table 1 identifies the steps that are usually performed by the terminal operator or computer specialist who enters the data, submits the programs for execution, and maintains the data files. This report contains detailed instructions for those steps.

Programs RXBUILD and RXFIRES each consist of two executable elements:

CSSG*R1LIB.RXBUILD and CSSG*R1LIB.RXBUILD2
CSSG*R1LIB.RXFIRES and CSSG*R1LIB.RXFIRES2

Table 1.—List of steps necessary to operate programs RXBUILD and RXFIRES

Fire planner responsibilities	Terminal operator responsibilities
PROGRAM RXBUILD	
1. Complete RXBUILD input worksheet.	
	2. Determine NFWDL tape name. (Consult Furman and Brink 1975)
	3. Create NFODL SPSS-style fire file. (Consult Vancik and Roussopoules 1982).
	4. Access CSSG*R1LIB.RXBUILD to enter worksheet items and create an input directive file.
	5. @ADD the RXBUILD directive file to execute CSSG*R1LIB.RXBUILD2.
6. Interpret RXBUILD output.	
PROGRAM RXFIRES	
7. Complete RXFIRES input worksheet.	
	8. Access CSSG*R1LIB.RXFIRES to enter worksheet items and create an input directive file.
	9. @ADD the RXFIRES directive file to execute CSSG*R1LIB.RXFIRES2.
10. Interpret RXFIRES output.	
11. Return to step 7 for next test prescription.	

Executable elements RXBUILD and RXFIRES are interactive routines that prompt the terminal operator for items from the RXBUILD and RXFIRES input worksheets, respectively. They test each entry for value-range and decimal point. If errors are detected, a diagnostic message is printed to the terminal and the item can then be reentered correctly. Both routines write the edited entries and additional Exec 8 control statements to an output file on logical unit 7. The output files become the input directive files for executable elements RXBUILD2 and RXFIRES2.

Executable elements RXBUILD2 and RXFIRES2 are batch routines initiated by @ADDing the respective input directive files created by RXBUILD and RXFIRES.

The interaction between users, executable elements, and input and output files is shown in figure 1. A list of the 60 variables that can be used as prescription parameters in programs RXBUILD and RXFIRES is contained in table 2.

Figure 1.—Structure and operational routine for programs RXBUILD and RXFIRES.

Table 2.—List of variables that can be used as prescription parameters; programs RXBUILD and RXFIRES

Variable code	Variable name	Variable value code and unit of measure
1	Agency	1 = USDA Forest Service
2	Region	1 = R1, 2 = R2, ..., 0 = R10
3	Administering National Forest	Coded; consult FSH 5109-14
4	District	Coded; consult FSH 5109-14
5	Reporting National Forest	Coded; consult FSH 5109-14
6	Jurisdiction at origin	Coded; consult FSH 5109-14
7	State	Coded; consult FSH 5109-14
8	County	Coded; consult FSH 5109-14
9	Watershed	Coded; consult FSH 5109-14
10	Supervisor's fire number	
11	Year of origin	70 = 1970, 81 = 1981
12	Month of origin	1 = Jan, 2 = Feb, ..., 12 = Dec
13	Date of origin	0101 = Jan 1, 0615 = Jun 15, 1231 = Dec 31
14	Day of week of origin	1 = Sun, 2 = Mon, ..., 7 = Sat
15	Statistical cause	Coded; consult FSH 5109-14
16	General cause	Coded; consult FSH 5109-14
17	Specific cause	Coded; consult FSH 5109-14
18	Fire size class	1 = A, 2 = B, ..., 7 = G
19	Acres burned	Actual value; nearest whole acre
20	Individuals who started fire	Coded; consult FSH 5109-14
21	Hour of fire origin	Nearest hour, 24-hour clock time
22	Total hours to control	Actual value; nearest whole hour
23	Max. - suppression personnel	Actual number
24	Slope class	Coded; consult FSH 5109.14
25	Aspect class	Coded; consult FSH 5109.14
26	Elevation class	Coded; consult FSH 5109.14
27	Topography class	Coded; consult FSH 5109.14
28	Cover type at origin	Coded; consult FSH 5109.14
29	Fuel type at origin	Coded; consult FSH 5109.14
30	Fuel type prevailing	Coded; consult FSH 5109.14
31	State of the weather	Coded; consult FSH 5109.14
32	Temperature	Actual value; nearest whole °F
33	Relative humidity	Actual value; nearest whole percent
34	Wind direction	Coded; consult Deeming and others (1977)
35	Windspeed per hour	Actual value; nearest whole mile
36	Maximum temperature	Actual value; nearest whole °F
37	Minimum temperature	Actual value; nearest whole °F
38	Maximum relative humidity	Actual value; nearest whole percent
39	Minimum relative humidity	Actual value; nearest whole percent
40	Precipitation duration	Actual value; nearest whole hour
41	Precipitation trace	1 = trace, 0 = none
42	Precipitation amount	Actual value; nearest 100th of an inch
43	Lightning activity level	Coded
44	Man-caused risk	Actual value; nearest 100th
45	1-hour fuel moisture	Actual value; nearest 10th percent
46	10-hour fuel moisture	Actual value; nearest 10th percent
47	100-hour fuel moisture	Actual value; nearest 10th percent
48	1000-hour fuel moisture	Actual value; nearest 10th percent
49	Live woody fuel moisture	Actual value; nearest whole percent
50	Live herbaceous fuel moisture	Actual value; nearest whole percent
51	Ignition component	Actual value
52	Spread component	Actual value
53	Energy release component	Actual value
54	Person-caused occurrence index	Actual value
55	Lightning occurrence index	Actual value
56	Burning index	Actual value
57	Fire load index	Actual value
58	Manning level variable 1	Coded; user defined
59	Manning level variable 2	Coded; user defined
60	Manning level variable 3	Coded; user defined

¹USDA Forest Service, Individual Fire Report Handbook, Form 5100-29.

INITIAL DATA ENTRY
Obtain Fire Weather Data Tape Name

Program RXBUILD retrieves archived AFFIRMS weather observations from the National Fire Weather Data Library (NFWDL) (Furman and Brink 1975). The data are stored on magnetic tape by AFFIRMS station 6-digit ID number and year. It is necessary to supply RXBUILD with the name of the tape containing data for the first year of the lowest numbered AFFIRMS station (step 2, table 1 and fig. 1). The following run stream will produce a one-page listing of the AFFIRMS data tapes:

```
Image   0         1         2         3         4
No.     12345678901234567890123456789012345678890
  1     @RUN,...
  2     @ASG,A FIREDATALIB*PROGRAMS.
  3     @XQT    FIREDATALIB*PROGRAMS.LISTFILES
  4     @FIN
```

Output from the run sequence is shown in exhibit 1. Tape qualifier and file names are in the left column. The station-year limits are in format "sssssyy", where "ssssss" is the 6-digit AFFIRMS station number and "yy" is the last two digits of the year.

Data for AFFIRMS station 240112 beginning in 1970 (e.g., "STATION-YEAR LIMITS" of 24011270), for example, are stored on tape FIREDATALIB* 21-24. RXBUILD must be supplied with the file name portion only, or "21-24.".

Caution: Tape names and station-year limits are updated periodically. Consult Furman and Brink (1975) for a more complete discussion of the NFWDL.

Create a Fire Report File

Program RXBUILD reads fire report records generated by the National Fire Occurrence Data Library (NFODL) program NFODL*PROGRAMS.RETRIEVE (Yancik and Roussopoulos 1982). The following run stream will create a file of fire reports from 1970 through 1980 for Forest 14, Region 1 (step 3, table 1, and fig. 1):

```
Image   0         1         2         3         4
No.     12345678901234567890123456789012345678890
  1     @RUN,...
  2     @ASG,A  NFODL*PROGRAMS.
  3     @XQT    NFODL*PROGRAMS.NFO-RETRIEVE
  4     USAGE SPSS
  5     REGION 01
  6     FOREST 14 1970-1980
  7     @EOF
  8     @FIN
```

Program NFO-RETRIEVE dynamically creates a mass storage data file of the retrieved historical fire-occurrence records. The files are available for 6 calendar days from the time of initial creation unless @SAVE'd for a longer period. The name of the newly created fire file has the format:

NFOrrffSPSS*mmddyyhhmmss

where "rr" is the Region number, "ff" is the Forest number, "mmddyy" is the month, day, and year the file was created, and "hhmmss" is the hour, minute, and second of file creation.

FILE	STATION-YEAR LIMITS FROM	THROUGH	DATE OF LAST UPDATE
FIREDATALIB*00-03	00000000	03999999	030283
FIREDATALIB*04	04000000	04079999	030283
FIREDATALIB*04A	04080000	04329999	030283
FIREDATALIB*04B	04330000	04510599	030283
FIREDATALIB*04C	04510600	04999999	030283
FIREDATALIB*05-09	05000000	09999999	030283
FIREDATALIB*10	10000000	10109999	030283
FIREDATALIB*10A-20	10110000	20999999	030283
FIREDATALIB*21-24	21000000	24179999	030283
FIREDATALIB*24A-26	24180000	26999999	030283
FIREDATALIB*27-35	27000000	35239999	030283
FIREDATALIB*35A-41	35240000	41999999	030283
FIREDATALIB*42-45	42000000	45169999	030283
FIREDATALIB*45A-47	45170000	47999999	030283
FIREDATALIB*48-50	48000000	50999999	030283
FIREDATALIB*NEWYR	00000000	99999999	062083
FIREDATALIB*FRCST	00000000	99999999	062083
FIREDATALIB*FSTALL	00000000	99999999	030283

NOTE – THE TIME LAG IN THE RECORDING OF THE LIGHTNING ACTIVITY LEVEL HAS BEEN REMOVED FROM THE DATA IN THE REGULAR LIBRARY, BUT IS STILL PRESENT IN THE NEW DATA BEING COLLECTED (NEWDAT). IT WILL BE REMOVED WHEN THAT DATA IS MERGED INTO THE REGULAR LIBRARY.

Exhibit 1.—Sample program FIREDATALIB*PROGRAMS.LISTFILES output.

To obtain further documentation of the NFODL, use the following run stream:

```
Image    0          1          2          3          4
No.    12345678901234567890123456789012345678901234567890
  1    @RUN,...
  2    @ASG,A  NFODL'INFORMATION.
  3    @PRT,S  NFODL'INFORMATION.RETRIEVE
  4    @PRT,S  NFODL'INFORMATION.VARIABLES
  5    @PRT,S  NFODL'INFORMATION.CODES
  6    @FIN
```

PROGRAM RXBUILD
RXBUILD Initiation

Use program CSSG*R1LIB.RXBUILD to enter items from the RXBUILD input worksheet to a DEMAND terminal. A file (qual*rxbuild-dir.) must be assigned to logical unit 7 to hold the directives written by RXBUILD. The following run stream is used to initiate CSSG*R1LIB.RXBUILD interactive processing at a DEMAND terminal (step 4, table 1, and fig. 1):

```
Image    0          1          2          3          4
No.    12345678901234567890123456789012345678901234567890
  1    @RUN,...
  2    @ASG,A  CSSG'R1LIB.
  3    @ASG,UP  qual'rxbuild-dir.
  4    @USE 7.,qual'rxbuild-dir.
  5    @XQT    CSSG'R1LIB.RXBUILD
```

All items entered from the RXBUILD worksheet into the terminal are edited and written onto the RXBUILD directive file named "qual*rxbuild-dir.".

RXBUILD Data Entry

RXBUILD first asks the terminal operator whether an introduction is to be printed. The introduction contains one screen (24 lines) of program description, one screen of input rules, and one screen of interactive program in-

itiation information. RXBUILD then asks if an update is to be printed, and prints the date of the last update. The update will contain new information concerning RXBUILD and RXFIRES use.

RXBUILD then prompts the terminal operator for all items from the RXBUILD input worksheet. The following input rules apply:

1. All numeric entries must contain a decimal point. Failure to include the decimal will cause an error diagnostic to be printed to the terminal. The operator then has another chance to correctly reenter the data.

2. Entries may be made beginning in the left-most column.

3. Program execution may be terminated at any time by entering "STOP", beginning in the left-most column (it may be necessary to enter "STOP" twice successively). The program will terminate without writing a directive file on logical unit 7.

All entries are checked for value-range and decimal point. Self-explanatory error diagnostics are printed to the terminal if data entries are out of range or do not have a decimal point. The operator will be given another chance to correctly reenter the data or "STOP".

After all input items have been correctly entered, RXBUILD asks the operator whether to print directions on submitting the output directive file for CSSG*R1LIB.RXBUILD2 processing. The instructions contain two screens of information on file assignments and run streams. This information is discussed in the following pages.

A sample RXBUILD input session is shown in exhibit 2 for the Cabinet Wilderness fire management plan. The data were entered from the sample RXBUILD input worksheets shown in exhibit 3. Detailed instructions for completing RXBUILD input worksheets are given in the User's Guide (Bevins and Fischer 1983).

```
@ASG,A  CSSG*R1LIB.
FACILITY WARNING  000200100000
>@ASG,CP QUALIFIER*RXBUILD-DIR.
READY
>@USE 7.,QUALIFIER*RXBUILD-DIR.
READY
>@XQT    CSSG*R1LIB.RXBUILD


BEGIN CSSG*R1LIB.RXBUILD           DATE:062283    TIME:105437



ENTER "YES" IF YOU WANT AN INTRODUCTION.
>YES


PROGRAM        CSSG*R1LIB.RXBUILD

LANGUAGE       ASCII 3.9X-77 FORTRAN

MACHINE        UNIVAC 1100/84

USAGE          INTERACTIVE DEMAND (80 CHARACTERS)

PROGRAMMED     COLLIN D. BEVINS
               SYSTEMS FOR ENVIRONMENTAL MANAGEMENT
               P.O. BOX 3776
               MISSOULA, MONTANA  59806
               (406) 549-7478

REFERENCE      BEVINS,C.D., AND W.C. FISCHER.  1982.
               A COMPUTER SYSTEM FOR TESTING FIRE MANAGEMENT
               PRESCRIPTIONS, PART II: TERMINAL OPERATORS' MANUAL.
               USDA FOREST SERVICE GEN. TECH. REP. INT-   .
               INTERMTN. FOREST & RANGE EXPT. STN., OGDEN, UT. 84401

HIT CARRIAGE RETURN TO CONTINUE.
>
                    *************
                       ESCAPE!
                    *************

IF YOU WISH TO TERMINATE THIS PROGRAM AT ANY TIME,
ENTER THE COMMAND 'STOP' FOLLOWED BY A CARRIAGE RETURN.


                    *****************
                       INPUT RULES
                    *****************


1.  ALL INFORMATION MUST BE ENTERED BEGINNING IN COLUMN 1 .

2.  ALL NUMERIC DATA MUST INCLUDE A DECIMAL POINT .
    (TO BE SAFE, TERMINATE ALL INPUT WITH A DECIMAL POINT.)



HIT CARRIAGE RETURN TO CONTINUE.
>
                 **************************
                    CATALOG YOUR OUTPUT!
                 **************************

CSSG*R1LIB.RXBUILD IS AN INTERACTIVE PROGRAM THAT ASKS YOU
FOR INFORMATION REQUIRED TO BUILD A FIRE REPORT AND WEATHER
DATA FILE FOR SELECTED DISTRICTS ON A NATIONAL FOREST.

THE PROGRAM READS EACH PIECE OF INFORMATION ENTERED, CHECKS IT
FOR OBVIOUS ERRORS, AND WRITES IT TO AN OUTPUT FILE ON UNIT 7
FOR YOUR LATER USE.  YOU MUST HAVE @ASG'D AND @USE'D A FILE TO HOLD
THE PROGRAM OUTPUT ON LU 7 OR IT WILL DISAPPEAR AT @FIN TIME.

THE FOLLOWING RUN STREAM SHOULD BE USED:

1. @RUN,...
2. @ASG,A  CSSG*R1LIB.
3. @ASG,CP (YOUR QUALIFIER*FILENAME)
4. @USE 7.,(YOUR QUALIFIER*FILENAME).
5. @XQT    CSSG*R1LIB.RXBUILD

IF YOU DID NOT FOLLOW THE ABOVE PROCEDURE, ENTER 'STOP'
AND TRY AGAIN.  ENTER CARRIAGE RETURN TO CONTINUE.
>




ENTER "YES" IF YOU WANT THE LATEST UPDATE (03/01/82).
>YES
                    ************
                       UPDATE
                    ************

NO UPDATES OR ADDITIONS TO USERS' OR TERMINAL OPERATORS' MANUALS.
```

Exhibit 2.—Sample program RXBUILD data entry session.

```
HIT CARRIAGE RETURN TO CONTINUE
>
1.  TITLE.
    ENTER 1 TO 80 CHARACTERS.
>CABINET WILDERNESS AREA FIRE MANAGEMENT PLAN
2.  USER NAME.
    ENTER 1 TO 80 CHARACTERS.
>JOSEPH M. GLASSY
3.  REGION NAME OR NUMBER.
    ENTER 1 TO 80 CHARACTERS.
>NORTHERN REGION (R01)
4.  FOREST NAME.
    ENTER 1 TO 80 CHARACTERS.
>KOOTENAI NATIONAL FOREST (F14)
5.  FOREST ADP CODE.
    ENTER FOREST ADP CODE FROM 1. TO 30.
    INCLUDE THE DECIMAL POINT.
>14.
6.  NUMBER OF AFFIRMS WEATHER STATIONS.
    ENTER FROM 1. TO 10. STATIONS.
    INCLUDE THE DECIMAL POINT.
>2.
6. 1.   6-DIGIT ID OF AFFIRMS STATION NO.  1
        ENTER 6-DIGIT ID OF LOWEST NUMBERED AFFIRMS STATION.
        REMEMBER THE DECIMAL POINT!
>240112.
6. 1.1.  AFFIRMS STATION NAME.
         ENTER 1 TO 20 CHARACTERS.
>TROY RD AFFIRMS
6. 1.2.  AFFIRMS STATION ELEVATION.
         ENTER THE ELEVATION BETWEEN 0. AND 12000. FEET.
         INCLUDE THE DECIMAL POINT.
>1950.
6. 1.3.  AFFIRMS STATION LATITUDE.
         ENTER LATITUDE IN DEGREES.
         INCLUDE THE DECIMAL POINT.
>48.
6. 1.4.  NFDRS FUEL MODEL.
         ENTER LETTER A THROUGH U (EXCEPT M).
>G
6. 1.5.  NFDRS SLOPE CLASS.
         ENTER SLOPE CLASS 1. THROUGH 5.
         INCLUDE THE DECIMAL POINT.
>3.
6. 1.6.  NFDRS HERBACEOUS TYPE.
         ENTER LETTER P (PERENNIAL) OR LETTER A (ANNUAL).
>P

6. 1.7.  NFDRS CLIMATE CLASS.
         ENTER CLIMATE CLASS 1. THROUGH 4.
         INCLUDE THE DECIMAL POINT.
>3.
6. 1.8.  NFDRS GREENUP DATE.
         ENTER MONTH AND DAY OF YEARLY GREENUP
         FOR EXAMPLE, ENTER MAY 15 AS "0515.".
>601.
6. 1.9.  NFDRS FIRST FREEZE DATE.
         ENTER MONTH AND DAY OF FIRST ANNUAL FREEZE
         FOR EXAMPLE, ENTER SEPT 1 AS "0901.".
>915.
6. 1.10.  NFDRS WEEKDAY MAN RISK FACTOR.
          ENTER WEEKDAY MAN RISK FACTOR BETWEEN 0. AND 100.
          INCLUDE THE DECIMAL POINT.
>1.
6. 1.11.  NFDRS WEEKEND MAN RISK FACTOR.
          ENTER WEEKEND MAN RISK FACTOR BETWEEN 0. AND 100.
          INCLUDE THE DECIMAL POINT.
>1.
6. 1.12.  NFDRS LIGHTNING SCALING FACTOR.
          ENTER LIGHTNING FACTOR BETWEEN 0. AND 100.
          INCLUDE THE DECIMAL POINT.
>1.
6. 1.13.  NO. MANNING VARIABLES.
          ENTER 0. TO 3. MANNING VARIABLES TO BE DEFINED.
          INCLUDE THE DECIMAL POINT.
>2.
6. 1.13.1.1.  BASE VARIABLE FOR MANNING VARIABLE NO. 58.
              ENTER CODE OF VARIABLE USED IN
              COMPUTING THE MANNING VAR. NO.
              ENTER BASE VARIABLE CODE 31. TO 57.
              INCLUDE THE DECIMAL POINT.
>53.
6. 1.13.1.2.  NO. CLASSES OF MANNING VARIABLE NO. 58.
              ENTER FROM 4. TO 10. CLASSES.
              INCLUDE THE DECIMAL POINT.
>5.
6. 1.13.1.3.  90TH PERCENTILE VALUE OF BASE VARIABLE NO. 53.
              ENTER 90TH PERCENTILE VALUE.
              INCLUDE THE DECIMAL POINT.
>62.
6. 1.13.1.4.  97TH PERCENTILE VALUE OF BASE VARIABLE NO. 53.
              ENTER 97TH PERCENTILE VALUE.
              INCLUDE THE DECIMAL POINT.
>69.
6. 1.13.2.1.  BASE VARIABLE FOR MANNING VARIABLE NO. 59.
              ENTER CODE OF VARIABLE USED IN
              COMPUTING THE MANNING VAR. NO.
              ENTER BASE VARIABLE CODE 31. TO 58.
              INCLUDE THE DECIMAL POINT.
>56.
6. 1.13.2.2.  NO. CLASSES OF MANNING VARIABLE NO. 59.
              ENTER FROM 4. TO 10. CLASSES.
              INCLUDE THE DECIMAL POINT.
>5.
```

6. 1.13.2.3.   90TH PERCENTILE VALUE OF BASE VARIABLE NO. 56.
                ENTER 90TH PERCENTILE VALUE.
                INCLUDE THE DECIMAL POINT.
>59.
6. 1.13.2.4.   97TH PERCENTILE VALUE OF BASE VARIABLE NO. 56.
                ENTER 97TH PERCENTILE VALUE.
                INCLUDE THE DECIMAL POINT.
>68.
6. 2.   6-DIGIT ID OF AFFIRMS STATION NO.   2
        ENTER 6-DIGIT ID OF NEXT LOWEST AFFIRMS STATION.
        REMEMBER THE DECIMAL POINT!
>240116.
6. 2.1.   AFFIRMS STATION NAME.
           ENTER 1 TO 20 CHARACTERS.
>BIG SWEDE MTN.
6. 2.2.   AFFIRMS STATION ELEVATION.
           ENTER THE ELEVATION BETWEEN 0. AND 12000. FEET.
           INCLUDE THE DECIMAL POINT.
>4336.
6. 2.3.   AFFIRMS STATION LATITUDE.
           ENTER LATITUDE IN DEGREES.
           INCLUDE THE DECIMAL POINT.
>48.
6. 2.4.   NFDRS FUEL MODEL.
           ENTER LETTER A THROUGH U (EXCEPT M).
>G
6. 2.5.   NFDRS SLOPE CLASS.
           ENTER SLOPE CLASS 1. THROUGH 5.
           INCLUDE THE DECIMAL POINT.
>3.
6. 2.6.   NFDRS HERBACEOUS TYPE.
           ENTER LETTER P (PERENNIAL) OR LETTER A (ANNUAL).
>P
6. 2.7.   NFDRS CLIMATE CLASS.
           ENTER CLIMATE CLASS 1. THROUGH 4.
           INCLUDE THE DECIMAL POINT.
>3.
6. 2.8.   NFDRS GREENUP DATE.
           ENTER MONTH AND DAY OF YEARLY GREENUP
           FOR EXAMPLE, ENTER MAY 15 AS "0515.".
>601.
6. 2.9.   NFDRS FIRST FREEZE DATE.
           ENTER MONTH AND DAY OF FIRST ANNUAL FREEZE
           FOR EXAMPLE, ENTER SEPT 1 AS "0901.".
>915.
6. 2.10.   NFDRS WEEKDAY MAN RISK FACTOR.
            ENTER WEEKDAY MAN RISK FACTOR BETWEEN 0. AND 100.
            INCLUDE THE DECIMAL POINT.
>1.
6. 2.11.   NFDRS WEEKEND MAN RISK FACTOR.
            ENTER WEEKEND MAN RISK FACTOR BETWEEN 0. AND 100.
            INCLUDE THE DECIMAL POINT.
>1.
6. 2.12.   NFDRS LIGHTNING SCALING FACTOR.
            ENTER LIGHTNING FACTOR BETWEEN 0. AND 100.
            INCLUDE THE DECIMAL POINT.
>1.
6. 2.13.   NO. MANNING VARIABLES.
            ENTER 0. TO 3. MANNING VARIABLES TO BE DEFINED.
            INCLUDE THE DECIMAL POINT.
>2.
6. 2.13.1.1.   BASE VARIABLE FOR MANNING VARIABLE NO. 58.
                ENTER CODE OF VARIABLE USED IN
                COMPUTING THE MANNING VAR. NO.
                ENTER BASE VARIABLE CODE 31. TO 57.
                INCLUDE THE DECIMAL POINT.
>53.
6. 2.13.1.2.   NO. CLASSES OF MANNING VARIABLE NO. 58.
                ENTER FROM 4. TO 10. CLASSES.
                INCLUDE THE DECIMAL POINT.
>5.
6. 2.13.1.3.   90TH PERCENTILE VALUE OF BASE VARIABLE NO. 53.
                ENTER 90TH PERCENTILE VALUE.
                INCLUDE THE DECIMAL POINT.
>62.
6. 2.13.1.4.   97TH PERCENTILE VALUE OF BASE VARIABLE NO. 53.
                ENTER 97TH PERCENTILE VALUE.
                INCLUDE THE DECIMAL POINT.
>69.
6. 2.13.2.1.   BASE VARIABLE FOR MANNING VARIABLE NO. 59.
                ENTER CODE OF VARIABLE USED IN
                COMPUTING THE MANNING VAR. NO.
                ENTER BASE VARIABLE CODE 31. TO 58.
                INCLUDE THE DECIMAL POINT.
>56.
6. 2.13.2.2.   NO. CLASSES OF MANNING VARIABLE NO. 59.
                ENTER FROM 4. TO 10. CLASSES.
                INCLUDE THE DECIMAL POINT.
>5.
6. 2.13.2.3.   90TH PERCENTILE VALUE OF BASE VARIABLE NO. 56.
                ENTER 90TH PERCENTILE VALUE.
                INCLUDE THE DECIMAL POINT.
>59.
6. 2.13.2.4.   97TH PERCENTILE VALUE OF BASE VARIABLE NO. 56.
                ENTER 97TH PERCENTILE VALUE.
                INCLUDE THE DECIMAL POINT.
>68.
7. BEGINNING YEAR.
    FIRST YEAR OF FIRE REPORTS AND WEATHER DATA TO BE USED.
    ENTER LAST 2 DIGITS AND INCLUDE THE DECIMAL POINT.
>70.
8. ENDING YEAR.
    LAST YEAR OF FIRE REPORTS AND WEATHER DATA TO BE USED.
    ENTER LAST 2 DIGITS AND INCLUDE THE DECIMAL POINT.
>80.
9. BEGINNING SEASON DATE.
    FIRST MONTH AND DAY OF FIRE AND WEATHER DATA TO BE USED.
        ENTER IN MMDD FORMAT INCLUDE DECIMAL POINT.
        FOR EXAMPLE, ENTER MAY 15 AS "0515.".

Exhibit 2—(con.)

>101.
10.   ENDING SEASON DATE.
      LAST MONTH AND DAY OF FIRE AND WEATHER DATA TO BE USED.

            ENTER IN MMDD FORMAT INCLUDE DECIMAL POINT.
            FOR EXAMPLE, ENTER SEPT 1 AS "0901.".
>1231.
11.   NFWDL FILE NAME.
      ENTER NAME OF NFWDL FILE CONTAINING STATION YEAR LIMITS OF 24011270.
      ENTER FILENAME AND TERMINATE WITH A PERIOD.
>21-24.
12.   NUMBER OF DISTRICTS.
      ENTER FROM 1. TO 10. DISTRICTS WHOSE FIRE REPORTS ARE TO BE MATCHED
      WITH AFFIRMS STATION WEATHER DATA.   INCLUDE DECIMAL POINT.
>3.
12. 1.1.   DISTRICT NAME.
            ENTER FROM 1 TO 20 CHARACTERS.
>TROY (D4)
12. 1.2.   DISTRICT ADP CODE.
            ENTER ADP CODE (AND DECIMAL POINT) AS USED ON 5100-29 REPORTS.
>4.
12. 1.3.   DISTRICT AFFIRMS STATION.
            ENTER SEQUENTIAL NUMBER (FROM COLUMN 1) OF AFFIRMS STATION
            REPRESENTING TROY (D4)   DISTRICT.
            ASSIGN ONE OF THE FOLLOWING STATIONS (1.- 2.):
               1.   240112   TROY RD AFFIRMS
               2.   240116   BIG SWEDE MTN.
>1.
12. 2.1.   DISTRICT NAME.
            ENTER FROM 1 TO 20 CHARACTERS.
>LIBBY (D5)
12. 2.2.   DISTRICT ADP CODE.
            ENTER ADP CODE (AND DECIMAL POINT) AS USED ON 5100-29 REPORTS.
>5.
12. 2.3.   DISTRICT AFFIRMS STATION.
            ENTER SEQUENTIAL NUMBER (FROM COLUMN 1) OF AFFIRMS STATION
            REPRESENTING LIBBY (D5)   DISTRICT.
            ASSIGN ONE OF THE FOLLOWING STATIONS (1.- 2.):
               1.   240112   TROY RD AFFIRMS
               2.   240116   BIG SWEDE MTN.
>2.
12. 3.1.   DISTRICT NAME.
            ENTER FROM 1 TO 20 CHARACTERS.
>CABINET (D7)
12. 3.2.   DISTRICT ADP CODE.
            ENTER ADP CODE (AND DECIMAL POINT) AS USED ON 5100-29 REPORTS.
>7.
12. 3.3.   DISTRICT AFFIRMS STATION.
            ENTER SEQUENTIAL NUMBER (FROM COLUMN 1) OF AFFIRMS STATION
            REPRESENTING CABINET (D7)   DISTRICT.
            ASSIGN ONE OF THE FOLLOWING STATIONS (1.- 2.):
               1.   240112   TROY RD AFFIRMS
               2.   240116   BIG SWEDE MTN.
>2.
13.   FIRE REPORT FILE LISTING.
      ENTER "YES" IF YOU WANT A FIRE REPORT FILE LISTING.
>YES

14.   WEATHER DATA FILE LISTING.
      ENTER "YES" IF YOU WANT A WEATHER FILE LISTING.
>YES

ENTER "YES" IF YOU WANT A SAMPLE CSSG*R1LIB.RXBUILD2 RUN STREAM.
>YES

****
   PROCEDURE TO BUILD FIRE REPORT AND WEATHER DATA FILES
****

TO CREATE THE FIRE REPORT AND WEATHER DATA FILES, YOU MUST
ASSIGN AND USE THE FOLLOWING FILES:

1. @ASG,A   THE RXBUILD DIRECTIVE FILE YOU JUST CREATED BY THIS
             PROGRAM.
2. @ASG,A   A FILE CONTAINING FIRE REPORTS GENERATED BY THE NATL.
             FIRE OCCURRENCE LIBRARY NFODL*PROGRAMS.RETRIEVE PROGRAM.
3. @ASG,CP A FILE TO CONTAIN THE NEWLY GENERATED FIRE REPORT FILE.
4. @ASG,CP A FILE TO CONTAIN THE NEWLY GENERATED WEATHER DATA
             FILE.

HIT CARRIAGE RETURN TO CONTINUE.

>

```
THE FOLLOWING PROCEDURE SHOULD 8E USED  (USE YOUR OWN QUALIFIER
AND FILENAMES TO REPLACE THOSE IN PARENTHESIS 8ELOW):

1.   @RUN,...
2.   @ASG,A    (INPUT DIRECTIVE FILE YOU JUST CREATED)
3.   @ASG,A    (NFODL FIRE REPORT FILE)
4.   @USE  10.,(NFODL FIRE REPORT FILE)
5.   @DELETE,C (FILE TO CONTAIN FIRE REPORT OUTPUT)
6.   @ASG,CP   (FILE TO CONTAIN FIRE REPORT OUTPUT)
7.   @USE   3.,(FILE TO CONTAIN FIRE REPORT OUTPUT)
8.   @DELETE,C (FILE TO CONTAIN WEATHER DATA OUTPUT)
9.   @ASG,CP   (FILE TO CONTAIN WEATHER DATA OUTPUT),F40///800.
10.  @USE   8.,(FILE TO CONTAIN WEATHER DATA OUTPUT)
11.  @ADD,P    (INPUT DIRECTIVE FILE YOU JUST CREATED)
12.  @FIN



END CSSG*R1LI8.RX8UILD           DATE: 062283       TIME: 110450
>@FIN



  RUNID: S22CD8   ACCT: 1122314412     PROJECT: SEMLIB

***** DISPLAYED LOG ENTRY SECTION *****
  11:05:19         S22CD8 FIN

***** RESOURCE UTILIZATION SECTION *****
   RESOURCE                                     AVG
     TIME         CPU          IO         CCER    SIZE
 ------------ ------------ ------------ ------------ ----
 00:00:01.979 00:00:00.364 00:00:01.459 00:00:07.470   6K  SUMMARY

  IMAGES  READ:   82       PAGES:  8

  START:   10:53:28 JUN 22,1983    FIN:  11:05:19 JUN 22,1983

***** COST SECTION *****

  CHARGES 8ASED ON   DEMAND RUN
  RT  ($001.35/MIN)   :$000000.04
  CPU ($002.88/MIN)   :$000000.01
  IO  ($001.50/MIN)   :$000000.03
  CCER($002.88/MIN)   :$000000.35
                      ----------

  CONNECT TIME CHARGE: $000001.19

  ESTIMATED TOTAL COST:$000001.62
                       ==========
*TERMINAL INACTIVE*
>
```

Exhibit 2—(con.)

SHEET NO. 1 -- RUN IDENTIFICATION

1. TITLE. (Enter 1 to 80 characters.)

    __CABINET WILDERNESS FIRE MANAGEMENT PLAN__

2. USER NAME. (Enter 1 to 80 characters.)

    __COLLIN D. BEVINS__

3. REGION NAME OR NUMBER. (Enter 1 to 80 characters.)

    __NORTHERN REGION__

4. FOREST NAME. (Enter 1 to 80 characters.)

    __KOOTENAI__

5. FOREST ADP CODE.   __14.__

6. NUMBER OF AFFIRMS WEATHER STATIONS TO BE USED

    IN THIS RUN.[1/]   __2.__

    List of AFFIRMS stations to be used. List in order of increasing

    station number - smallest number first, largest number last.

    6.__1__. __TROY__   __240112__

    6.__2__. __BIG SWEDE__   _____

    6.___. _____   _____

    6.___. _____   _____

    6.___. _____   _____

    6.___. _____   _____

    _____

    [1/] Complete a separate Sheet No. 2 for each of the AFFIRMS stations
    listed in Item No. 6 above.

                        Page __1__ of __7__

Exhibit 3a.—Sample RXBUILD Input Worksheet No. 1, Run Identification.

SHEET NO. 2 -- AFFIRMS STATION PARAMETERS

6._I_.	6-DIGIT AFFIRMS STATION ID.	__240112__.
6._I_.1	AFFIRMS STATION NAME.[1]	__TROY RD AFFIRMS__
6._I_.2	AFFIRMS STATION ELEVATION.	__1950__.
6._I_.3	AFFIRMS STATION LATITUDE.	__48__.
6._I_.4	NFDRS FUEL MODEL.	G
6._I_.5	NFDRS SLOPE CLASS.	__3__.
6._I_.6	NFDRS HERBACEOUS TYPE.	P
6._I_.7	NFDRS CLIMATE CLASS.	__3__.
6._I_.8	NFDRS GREENUP DATE.	__601__.
6._I_.9	NFDRS FIRST FREEZE DATE.	__915__.
6._I_.10	NFDRS WEEKDAY MAN RISK FACTOR.	__1__.
6._I_.11	NFDRS WEEKEND MAN RISK FACTOR.	__1__.
6._I_.12	NFDRS LIGHTNING SCALING FACTOR.	__1__.
6._I_.13	NUMBER OF MANNING VARIABLES.[2]	__2__.

---

[1] 20 characters maximum.

[2] Complete Sheet No. 3 if Item No. 6.__.13 is greater than 0. A
separate Sheet No. 3 must be completed for each AFFIRMS station
indicated in Item 6, Sheet No. 1.

Exhibit 3b.—Sample RXBUILD Input Worksheet No. 2, AFFIRMS Station
Parameters, for first AFFIRMS station to be used in this run (AFFIRMS
station with smallest ID number).

SHEET NO. 3 -- RUN IDENTIFICATION

AFFIRMS STATION NO. __2 4 0 1 1 2__

MANNING VARIABLE NO. 1

6.__1__.13.1.1   BASE VARIABLE FOR MANNING LEVEL.   __53.__

6.__1__.13.1.2   NO. OF MANNING LEVEL CLASSES.   __5.__

6.__1__.13.1.3   90th PERCENTILE VALUE OF BASE VARIABLE.   __62.__

6.__1__.13.1.4   97th PERCENTILE VALUE OF BASE VARIABLE.   __69.__

MANNING VARIABLE NO. 2

6.__1__.13.2.1   BASE VARIABLE FOR MANNING LEVEL.   __56.__

6.__1__.13.2.2   NO. OF MANNING LEVEL CLASSES.   __5.__

6.__1__.13.2.3   90th PERCENTILE VALUE OF BASE VARIABLE.   __59.__

6.__1__.13.2.4   97th PERCENTILE VALUE OF BASE VARIABLE.   __68.__

MANNING VARIABLE NO. 3

6.____.13.3.1   BASE VARIABLE FOR MANNING LEVEL.   ____ ____

6.____.13.3.2   NO. OF MANNING LEVEL CLASSES.   ____ ____

6.____.13.3.3   90th PERCENTILE VALUE OF BASE VARIABLE.   ____ ____

6.____.13.3.4   97th PERCENTILE VALUE OF BASE VARIABLE.   ____ ____

Exhibit 3c.—Sample RXBUILD Input Worksheet No. 3, Manning Variable Parameters, for first AFFIRMS station to be used in this run (AFFIRMS station with smallest ID number).

SHEET NO. 2 -- AFFIRMS STATION PARAMETERS

6.**2**.	6-DIGIT AFFIRMS STATION ID.	**240116**.
6.**2**.1	AFFIRMS STATION NAME.[1]/	**BIG SWEDE MTN**
6.**2**.2	AFFIRMS STATION ELEVATION.	**4336**.
6.**2**.3	AFFIRMS STATION LATITUDE.	**48**.
6.**2**.4	NFDRS FUEL MODEL.	**G**
6.**2**.5	NFDRS SLOPE CLASS.	**3**.
6.**2**.6	NFDRS HERBACEOUS TYPE.	**P**
6.**2**.7	NFDRS CLIMATE CLASS.	**3**.
6.**2**.8	NFDRS GREENUP DATE.	**601**.
6.**2**.9	NFDRS FIRST FREEZE DATE.	**915**.
6.**2**.10	NFDRS WEEKDAY MAN RISK FACTOR.	**1**.
6.**2**.11	NFDRS WEEKEND MAN RISK FACTOR.	**1**.
6.**2**.12	NFDRS LIGHTNING SCALING FACTOR.	**1**.
6.**2**.13	NUMBER OF MANNING VARIABLES.[2]/	**2**.

---

[1]/ 20 characters maximum.

[2]/ Complete Sheet No. 3 if Item No. 6.__.13 is greater than 0. A
separate Sheet No. 3 must be completed for each AFFIRMS station
indicated in Item 6, Sheet No. 1.

Exhibit 3d.—Sample RXBUILD Input Worksheet No. 2, AFFIRMS Station
Parameters, for second AFFIRMS station to be used in this run
(AFFIRMS station with largest ID number).

SHEET NO. 3 -- RUN IDENTIFICATION

AFFIRMS STATION NO. __2 4 0 1 1 6__

MANNING VARIABLE NO. 1

6.__2__.13.1.1   BASE VARIABLE FOR MANNING LEVEL.   __53__.

6.__2__.13.1.2   NO. OF MANNING LEVEL CLASSES.   __5__.

6.__2__.13.1.3   90th PERCENTILE VALUE OF BASE VARIABLE.   __62__.

6.__2__.13.1.4   97th PERCENTILE VALUE OF BASE VARIABLE.   __69__.

MANNING VARIABLE NO. 2

6.__2__.13.2.1   BASE VARIABLE FOR MANNING LEVEL.   __56__.

6.__2__.13.2.2   NO. OF MANNING LEVEL CLASSES.   __5__.

6.__2__.13.2.3   90th PERCENTILE VALUE OF BASE VARIABLE.   __59__.

6.__2__.13.2.4   97th PERCENTILE VALUE OF BASE VARIABLE.   __68__.

MANNING VARIABLE NO. 3

6.__.13.3.1   BASE VARIABLE FOR MANNING LEVEL.   __ __ __

6.__.13.3.2   NO. OF MANNING LEVEL CLASSES.   __ __ __

6.__.13.3.3   90th PERCENTILE VALUE OF BASE VARIABLE.   __ __ __ __

6.__.13.3.4   97th PERCENTILE VALUE OF BASE VARIABLE.   __ __ __ __

Page __5__ of __7__

Exhibit 3e.—Sample RXBUILD Input Worksheet No. 3, Manning Variable
Parameters, for second AFFIRMS station to be used in this run
(AFFIRMS station with largest ID number).

SHEET NO. 4 -- DATE PARAMETERS

7. BEGINNING YEAR.   _70_ .

8. ENDING YEAR.   _80_ .

9. BEGINNING SEASON DATE.   _ _1_0_1_ .

10. ENDING SEASON DATE.   _1_2_3_1_ .

11. NFWDL FILE NAME.   _2_1_-_2_4_ . _ _ _ _ _ _

12. NUMBER OF DISTRICTS.[1]   _3_ .

13. FIRE REPORT LISTING?   _YES_

14. WEATHER DATA FILE LISTING?   _YES_

---

[1] Information on each District indicated here included on a Sheet No. 5, District Parameters.

Page __6__ of __7__

Exhibit 3f.—Sample RXBUILD Input Worksheet No. 4, Date Parameters.

SHEET NO. 5 -- DISTRICT PARAMETERS

DISTRICT NO. **1**

12.1.1   DISTRICT NAME.   **TROY   D4**

12.1.2   DISTRICT ADP CODE.   **4.**

12.1.3   DISTRICT AFFIRMS STATION. **(TROY-240112)**   **1.**

DISTRICT NO. **2**

12.2.1   DISTRICT NAME.   **LIBBY   D5**

12.2.2   DISTRICT ADP CODE.   **5.**

12.2.3   DISTRICT AFFIRMS STATION. **(BIG SWEDE-240116)**   **2.**

DISTRICT NO. **3**

12.3.1   DISTRICT NAME.   **CABINET   D7**

12.3.2   DISTRICT ADP CODE.   **7.**

12.3.3   DISTRICT AFFIRMS STATION. **(BIG SWEDE-240116)**   **2.**

Exhibit 3g.—Sample RXBUILD Input Worksheet No. 5, District Parameters. Sheet No. 5 must contain information about each Ranger District indicated in item 12, sheet No. 4.

RXBUILD Batch Processing

Program CSSG*R1LIB.RXBUILD creates a directive file (qual*rxbuild-dir.) that must be @ADD'ed to initiate batch processing of CSSG*R1LIB.RXBUILD2 from a DEMAND terminal (step 5, table 1, and fig. 1). Data files assigned to the run include the NFODL fire report file (NFOrrffSPSS*mmddyyhhmmss.), an output file to contain the processed fire report data (qual*firefile.), and an 800-track output file to contain the processed AFFIRMS fire-weather data (qual*weatherfile.).

The following run stream is used to initiate RXBUILD batch processing from a DEMAND terminal:

```
Image    0          1          2          3          4
No.      12345678901234567890123456789012345678901234567890
 1       @RUN,...
 2       @ASG,A    NFOrrffSPSS*mmddyyhhmmss.
 3       @USE 10.,NFOrrffSPSS*mmddyyhhmmss.
 4       @ASG,CP   qual*firefile.
 5       @USE  3.,qual*firefile.
 6       @ASG,CP   qual*weatherfile.,F40///800
 7       @USE  8.,qual*weatherfile.
 8       @ASG,A    qual*rxbuild-dir.
 9       @ADD,P    qual*rxbuild-dir.
10       @FIN
```

It is not necessary to @ASG the Region 1 shared library or @XQT the executable element RXBUILD2 because these steps are performed dynamically from the RXBUILD directive file (qual*rxbuild-dir.).

The two mass storage output files "qual*firefile." and "qual*weatherfile." are available for 6 calendar days following their creation by the above run stream unless @SAVE'd for a longer period. It is generally less expensive to re-create both data files as needed rather than @SAVE more than 800 tracks of mass storage.

RXBUILD Costs

DEMAND terminal data entry using program RXBUILD takes less than 20 minutes for the example in exhibit 2. Total time would be less if no introductory, update, or initiation information were requested. DEMAND costs for the example were $0.46, and connect time charges $1.48, for a total cost of less than $2.

Executable element RXBUILD2 batch processing of the directive file created in exhibit 2 cost $4.72 at P priority. The cost includes FIREDATALIB*PROGRAMS.GETDATA2 processing to retrieve fire-weather observations from the NFWDL and NFDR78*FIREFAMILY.FIREDAT1 processing to derive NFDRS indices. Both routines are dynamically assigned and initiated during RXBUILD batch processing.

PROGRAM RXFIRES
RXFIRES Initiation

Use program CSSG*R1LIB.RXFIRES to enter items from the RXFIRES input worksheets to a DEMAND terminal. A file (qual*rxfires-dir.) must be assigned to logical unit 7 to hold the directives written by RXFIRES. The following run stream is used to initiate CSSG*R1LIB.RXFIRES interactive processing at a DEMAND terminal (step 8, table 1, and fig. 1).

```
Image  0          1          2          3          4
No.    12345678901234567890123456789012345678901234567890
 1     @RUN,...
 2     @ASG,A    CSSG*R1LIB.
 3     @ASG,UP qual*rxfires-dir.
 4     @USE 7.,qual*rxfires-dir.
 5     @XQT      CSSG*R1LIB.RXFIRES
```

All items entered from the RXFIRES worksheet into the terminal are edited and written onto the RXFIRES directive file named "qual*rxfires-dir.".

RXFIRES Data Entry

RXFIRES first asks the terminal operator whether an introduction is to be printed. The introduction contains one screen (24 lines) of program description, one screen of input rules, one screen of RXFIRES interactive initiation procedures, one screen of file assignment information, and one screen of RXFIRES batch processing initiation information. All these topics are discussed in the following pages.

RXFIRES then prompts the terminal operator for all items from the RXFIRES input worksheet. The following rules apply:

1. All numeric entries must contain a decimal point. Failure to include the decimal will cause an error diagnostic to be printed to the terminal. The operator then has another chance to correctly reenter the data.

2. Numeric entries may be either right- or left-justified within the entry field provided.

3. Program execution may be terminated at any time by entering "STOP" beginning in the left-most column (it may be necessary to enter "STOP" twice successively). The program will terminate without creating a directive file on logical unit 7.

All entries are checked for value-range and decimal point. Self-explanatory error diagnostics are printed to the terminal if data entries are out of range or do not have a decimal point. The operator will be given another chance to correctly reenter the data or "STOP".

A sample RXFIRES input session is shown in exhibit 4 for the Cabinet Wilderness Area fire management plan. The data were entered from the sample RXFIRES input worksheets shown in exhibit 5.

```
@ASG,A  CSSG*R1LIB.
FACILITY WARNING  000200000000
>@ASG,CP QUALIFIER*RXFIRES-DIR.
READY
>@USE 7.,QUALIFIER*RXFIRES-DIR.
READY
>@XQT    CSSG*R1LIB.RXFIRES



BEGIN CSSG*R1LIB.RXFIRES



ENTER "YES" IF YOU WANT TO SEE INTRODUCTION.
>YES


PROGRAM       CSSG*R1LIB.RXFIRES

LANGUAGE      ASCII 3.9X-77 FORTRAN

MACHINE       UNIVAC 1100/84

USAGE         INTERACTIVE DEMAND (80 CHARACTERS)

PROGRAMMED    COLLIN D. BEVINS
              SYSTEMS FOR ENVIRONMENTAL MANAGEMENT
              P.O. BOX 3776
              MISSOULA, MONTANA  59806
              (406) 549-7478

REFERENCE     BEVINS,C.D., AND W.C. FISCHER.  1982.
              A COMPUTER SYSTEM FOR TESTING FIRE MANAGEMENT
              PRESCRIPTIONS, PART II: TERMINAL OPERATORS' MANUAL.
              USDA FOREST SERVICE GEN. TECH. REP. INT-   .
              INTERMTN. FOREST & RANGE EXPT. STN., OGDEN, UT. 84401

HIT CARRIAGE RETURN TO CONTINUE.
>
                 *************
                    ESCAPE!
                 *************

IF YOU WISH TO TERMINATE THIS PROGRAM AT ANY TIME,
ENTER THE COMMAND 'STOP' FOLLOWED BY A CARRIAGE RETURN.

                 *****************
                   INPUT RULES
                 *****************

1.  ALL INFORMATION MUST BE ENTERED BEGINNING IN COLUMN 1 .

2.  ALL NUMERIC DATA MUST INCLUDE A DECIMAL POINT .
    (TO BE SAFE, TERMINATE ALL INPUT WITH A DECIMAL POINT.)




HIT CARRIAGE RETURN TO CONTINUE.
>
                 ***************************
                   CATALOG YOUR OUTPUT!
                 ***************************

CSSG*R1LIB.RXFIRES IS AN INTERACTIVE PROGRAM THAT ASKS YOU
FOR INFORMATION REQUIRED TO BUILD A DIRECTIVE FILE TO @ADD
TO TEST ALTERNATIVE UNSCHEDULED FIRE PRESCRIPTIONS.

THE PROGRAM READS EACH PIECE OF INFORMATION ENTERED, CHECKS IT
FOR OBVIOUS ERRORS, AND WRITES IT TO AN OUTPUT FILE ON UNIT 7
FOR YOUR LATER USE.  YOU MUST HAVE @ASG'D AND @USE'D A FILE TO HOLD
THE PROGRAM OUTPUT ON LU 7 OR IT WILL DISAPPEAR AT @FIN TIME.

THE FOLLOWING RUN STREAM SHOULD BE USED:

1.  @RUN,...
2.  @ASG,A CSSG*R1LIB.
3.  @ASG,CP (YOUR QUALIFIER*FILENAME)
4.  @USE 7.,(YOUR QUALIFIER*FILENAME).
5.  @XQT CSSG*R1LIB.RXFIRES

IF YOU DID NOT FOLLOW THE ABOVE PROCEDURE, ENTER 'STOP'
AND TRY AGAIN.  ENTER CARRIAGE RETURN TO CONTINUE.
>

****************************************************************
   PROCEDURE TO ACCESS AND RUN PROGRAM RXFIRES2
****************************************************************

TO SUBMIT THE NEWLY CREATED RXFIRES DIRECTIVE FILE,
YOU MUST ASSIGN AND USE THE FOLLOWING FILES:

1.  @ASG,A THE RXFIRES DIRECTIVE FILE YOU JUST CREATED BY THIS
           PROGRAM.
2.  @ASG,A FIRE REPORT FILE CREATED BY RXBUILD AND RXBUILD2.
3.  @ASG,A FIRE WEATHER FILE CREATED BY RXBUILD AND RXBUILD2.
```

Exhibit 4.—Sample Program RXFIRES Data Entry Session.

```
HIT CARRIAGE RETURN TO CONTINUE.
>


THE FOLLOWING PROCEDURE SHOULD BE USED  (USE YOUR OWN QUALIFIER
AND FILENAMES TO REPLACE THOSE IN PARENTHESIS BELOW):

1.  @RUN,...
2.  @ASG,A  (RXFIRES DIRECTIVE FILE YOU JUST CREATED)
3.  @ASG,A  (FIRE REPORT FILE CREATED BY RXBUILD)
4.  @USE 3.,(FIRE REPORT FILE CREATED BY RXBUILD)
5.  @ASG,A  (FIRE WEATHER FILE CREATED BY RXBUILD)
6.  @USE 8.,(FIRE WEATHER FILE CREATED BY RXBUILD)
7.  @ADD,P  (RXFIRES DIRECTIVE FILE YOU JUST CREATED)
8.  @FIN


1. RUN NAME.
   ENTER FROM 1 TO 80 CHARACTERS.
>CABINET WILDERNESS AREA FIRE MANAGEMENT PLAN: RUN NO. 1
2. USER NAME.
   ENTER FROM 1 TO 80 CHARACTERS.
>JOSEPH M. GLASSY
3. EXCLUSION CRITERIA.
   ENTER A VARIABLE CODE FROM 1. TO 60. UNDER THE COLUMN  HEADED "NO.".

   ENTER AN ARGUMENT UNDER COLUMN HEADED "AR".
   THE ARGUMENTS ARE ---EQ,NE,GT,LT,GE,LE---.

   ENTER VALUE OF 1 TO 10 DIGITS UNDER THE
   COLUMN HEADING "1234567890".
   HIT CARRIAGE RETURN TWICE TO CONTINUE TO NEXT STEP.

   YOU MAY ENTER FROM 0. TO 99. EXCLUSION CRITERIA.
   ...INCLUDE THE DECIMAL POINT...

 NO. AR 1234567890.
 --- -- ----------
>26. LT 4.
> 4. LT 4.
> 4. GT 7.
> 4. EQ 6.
>
4.  SUPPRESSION CRITERIA.
    ENTER A VARIABLE CODE FROM 1. TO 60. UNDER THE COLUMN  HEADED "NO.".

    ENTER AN ARGUMENT UNDER COLUMN HEADED "AR".
    THE ARGUMENTS ARE ---EQ,NE,GT,LT,GE,LE---.

    ENTER VALUE OF 1 TO 10 DIGITS UNDER THE
    COLUMN HEADING "1234567890".

    ENTER NUMBER OF DAYS PRIOR TO FIRE START THAT SUPPRESSION
    CRITERIA IS ENFORCED UNDER COLUMNS HEADED "DAYS".

    YOU MAY ENTER FROM 0. TO 99. SUPPRESSION CRITERIA.
    HIT CARRIAGE RETURN TWICE TO CONTINUE TO NEXT STEP.

    ...INCLUDE THE DECIMAL POINT...

 NO. AR 1234567890. DAYS.
 --- -- ----------- -----
>15. NE 1.
>53. GT 47.              4.
>
5. OUTPUT LEVEL.
   ENTER 1., 2., OR 3.
>3.
5.1  INCHES OF PRECIPITATION.
     ENTER INCHES OF RAIN REQUIRED TO EXTINGUISH FIRE.
     ...INCLUDE THE DECIMAL POINT...

>0.45
5.2  FIRE CASE HISTORY VARIABLES.
     ENTER FROM 0. TO 12. VARIABLE CODES TO BE PRINTED
     IN THE INDIVIDUAL MANAGEMENT FIRE CASE HISTORIES.

     ENTER UNDER COLUMNS HEADED "01." TO "12.".

     ...INCLUDE THE DECIMAL POINT...

 01. 02. 03. 04. 05. 06. 07. 08. 09. 10. 11. 12.
 --- --- --- --- --- --- --- --- --- --- --- ---
>08. 09. 14. 19. 22. 23. 51. 52. 53. 56.


5.3  FIRE LOAD SUMMARY TABLE DATES
     ENTER DATES TO BE USED IN FIRE LOAD SUMMARY TABLE.
     ENTER DATES AND YEARS UNDER APPROPRIATE COLUMNS
     ...INCLUDE THE DECIMAL POINT...

 FIRST LAST  FIRST LAST.
 MMDD. MMDD. YEAR. YEAR.
 ----- ----- ----- -----
>0601. 0920. 1970. 1980.
```

```
END PROGRAM CSSG*R1LI8.RXFIRES      DATE:062283   TIME:111313
>@FIN



  RUNID: S22CD8   ACCT: 1122314412     PROJECT: SEMLI8

***** DISPLAYED LOG ENTRY SECTION *****
  11:13:23        S22CD8 FIN

***** RESOURCE UTILIZATION SECTION *****
   RESOURCE                                  AVG
     TIME         CPU         IO        CCER    SIZE
  ------------ ------------ ------------ ------------ ----
  00:00:00.904 00:00:00.201 00:00:00.935 00:00:06.085   4K  SUMMARY

  IMAGES  READ:   26        PAGES:  5
                                            /
  START:    11:07:01 JUN 22,1983    FIN:  11:13:23 JUN 22,1983

***** COST SECTION *****

  CHARGES 8ASED ON    DEMAND RUN
  RT  ($001.35/MIN)    :$000000.02
  CPU ($002.88/MIN)    :$000000.00
  IO  ($001.50/MIN)    :$000000.02
  CCER($002.88/MIN)    :$000000.29
                       ----------

  CONNECT TIME CHARGE: $000000.64

  ESTIMATED TOTAL COST:$000000.97
                       ==========
*TERMINAL INACTIVE*
>
```

Exhibit 4.— (con.)

SHEET NO. 1 -- RUN IDENTIFICATION

1.   RUN NAME.

CABINET WILDERNESS FIRE MANAGEMENT PLAN

2.   USER NAME.

COLLIN BEVINS

3.   EXCLUSION CRITERIA.   (Use Sheet No. 2)

4.   FIRE SUPPRESSION CRITERIA. (Use Sheet No. 3)

5.   OUTPUT LEVEL.   **3 .**

5.1 INCHES OF PRECIPITATION.   **0 . 45**

5.2 FIRE CASE HISTORY VARIABLES.

0 1.   0 2.   0 3.   0 4.   0 5.   0 6.   0 7.   0 8.   0 9.   1 0.   1 1.   1 2.

8.   9.   14.   19.   22.   23.   51.   52.   53.   56.   ___   ___

5.3 FIRE LOAD SUMMARY TABLE DATES.   First   Last   First   Last

                                             MMDD.   MMDD. YEAR. YEAR.

                                             0601. 0920. 1970. 1980.

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Exhibit 5a.—Sample RXFIRES Input Worksheet No. 1, Run Identification.

Date **3-82**

SHEET NO. 2 -- FIRE EXCLUSION CRITERIA

EXCLUDE FIRES IF:

3.1 VARIABLE CODE	3.2 ARITHMETIC ARGUMENT	3.3 VALUE CODE	3.4 VARIABLE NAME	3.5 VARIABLE MEASURE
2 6 .	L T	___ 4 .	ELEVATION	4500 FT.
_ 4 .	L T	___ 4 .	}	_____
_ 4 .	G T	___ 7 . } DISTRICT *		_____
_ 4 .	E Q	___ 6 . }		_____
___	__	____ .	_____	_____
___	__	____ .	_____	_____

* EXCLUDE ALL DISTRICTS EXCEPT :

___	__	____ .	TROY (4)	_____
___	__	____ .	LIBBY (5)	_____
___	__	____ .	CABINET (7)	_____
___	__	____ .	_____	_____
___	__	____ .	_____	_____
___	__	____ .	_____	_____
___	__	____ .	_____	_____
___	__	____ .	_____	_____
___	__	____ .	_____	_____
___	__	____ .	_____	_____

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Exhibit 5b.—Sample RXFIRES Input Worksheet No. 2, Fire Exclusion Criteria.

SHEET NO. 3 -- FIRE SUPPRESSION CRITERIA

SUPPRESS FIRES IF:

4.1 VARIABLE CODE	4.2 ARITHMETIC ARGUMENT	4.3 VALUE CODE	4.4 PREVIEW DAYS	4.5 VARIABLE NAME	4.6 VARIABLE MEASURE
15.	NE	___ 1.	___	CAUSE	LIGHTNING
53.	GT	__ 47.	_4.	ERC	80 PERCENTILE
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____
___	__	____.	___	_____	_____

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Exhibit 5c.—Sample RXFIRES Input Worksheet No. 3, Fire Suppression
Criteria.

RXFIRES Batch Processing

Program CSSG*R1LIB.RXBUILD creates a directive file (qual*rxfires-dir.) that must be @ADD'ed to initiate batch processing of CSSG*R1LIB.RXFIRES2 from a DEMAND terminal (step 9, table 1, and fig. 1). Data files assigned to the run include the fire report file (qual*firefile.) and fire-weather file (qual*weatherfile.) created by a previous RXBUILD run.

The following run stream is used to initiate RXFIRES P batch processing from a DEMAND terminal:

```
Image   0         1         2         3         4
No.     1234567890123456789012345678901234567890
  1     @RUN,...
  2     @ASG,A    qual*firefile.
  3     @USE 3.,qual*firefile.
  4     @ASG,A    qual*weatherfile.
  5     @USE 8.,qual*weatherfile.
  6     @ASG,A    qual*rxfires-dir.
  7     @ADD,P    qual*rxfires-dir.
  8     @FIN
```

It is not necessary to @ASG the Region 1 shared library or @XQT the executable element RXFIRES2 because these steps are performed dynamically from the RXFIRES directive file (qual*rxfires-dir.).

Programs RXBUILD and RXFIRES may be submitted for batch processing in tandem, using the following run stream:

```
Image   0         1         2         3         4
No.     1234567890123456789012345678901234567890
  1     @RUN,...
  2     @ASG,A    NFOrrffSPSS*mmddyyhhmmss.
  3     @USE 10.,NFOrrffSPSS*mmddyyhhmmss.
  4     @ASG,CP   qual*firefile.
  5     @USE   3.,qual*firefile.
  6     @ASG,CP   qual*weatherfile.,F40///800
  7     @USE   8.,qual*weatherfile.
  8     @ASG,A    qual*rxbuild-dir.
  9     @ADD,P    qual*rxbuild-dir.
 10     @ASG,A    qual*rxfires-dir.
 11     @ADD,P    qual*rxfires-dir.
 12     @FIN
```

RXFIRES Costs

DEMAND terminal data entry using program RXFIRES takes about 20 minutes for the example in exhibit 4. Total time would be less if no introductory information was requested. DEMAND costs for the example were $0.38, and connect time charges $0.89, for a total cost of less than $2.

Batch processing of the executable element RXFIRES2 directive file (exhibit 5) cost $2.64 at P priority.

PUBLICATIONS CITED

Bevins, Collin D.; Fischer, William C. A computer system for testing fire management prescriptions: part 1—user's manual. Gen. Tech. Rep. INT-155. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1983. 42 p.

Deeming, John E.; Burgan, Robert E.; Cohen, Jack D. The National Fire-Danger Rating System—1978. Gen. Tech. Rep. INT-39. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1977. 63 p.

Furman, R. William; Brink, Glen E. The National Fire Weather Library: what it is and how to use it. Gen. Tech. Rep. RM-19. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station; 1975. 8 p.

Yancik, Richard F.; Roussopoulos, Peter J. User's guide to the National Fire Occurrence Data Library. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station; 1982. 25 p.

Bevins, Collin D.; Fischer, William C. A computer system for testing fire management prescriptions: part 2—computer terminal operator's manual. Gen. Tech. Rep. INT-156. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1983. 22 p.

Describes structure of a computer system that allows fire managers to evaluate alternative prescriptions for unscheduled prescribed fires. Provides instructions for initial data entry and execution of programs RXBUILD and RXFIRES, the two main components of the system. A companion publication, Part 1—User's Guide (Bevins and Fischer 1983), is available as a separate general technical report.

KEYWORDS: prescribed fire, fire management, fire management costs planning, land management planning, computer systems

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